

REMARKS

This paper is accompanied by a request for continued examination and is being presented in response to the final official action dated February 17, 2009, wherein: (a) claims 1-5 are pending; (b) claims 1-5 have been rejected under 35 USC § 112, ¶ 1, as lacking written description; (c) claims 1 and 5 have been rejected under 35 USC § 103(a) as being obvious over Joo et al. U.S. Patent No. 6,277,324 ("the Joo patent") patent in view of Japanese publication No. 07-188721 ("the Japanese publication") and Kepplinger et al. U.S. Patent Application No. 2003/0159541 (the "Kepplinger application"), and (d) claims 2-4 have been rejected under 35 USC § 103(a) as being obvious over the Joo patent in view of the Japanese publication and the Kepplinger application, and further in view of Kepplinger et al. U.S. Patent 6,379,420 ("the Kepplinger patent"). Reconsideration and withdrawal of the rejections are respectfully requested in view of the foregoing amendments and following remarks.

I. Brief Summary of the Amendments to the Claims

Claim 1 has been amended to recite that each fluidized bed includes a dispersing plate. Claim 1 has been further amended to recite that the reducing gas is heated by injected oxygen and partially combusted when it is supplied to the fluidized beds. In addition, claim 1 has been amended to recite that oxygen gas is directly injected to the heated reducing gas that passes through the dispersing plate to be partially combusted and further heated in the fluidized beds.

Support for the amendments to claim 1 can be found, for example, on page 10, lines 5-19. No new matter has been introduced by the foregoing amendments to the claims.

II. The 35 USC § 112, ¶ 1, Rejection

Claims 1-5 have been rejected as allegedly failing to comply with the written description requirement of 35 USC § 112, ¶ 1. See the Action at p. 2. The rejection under 35 USC § 112 is moot in view of the amendments to claim 1, because the amended claims now recite "partially combusting." Reconsideration and withdrawal of this rejection are respectfully requested.

III. The 35 USC § 103(a) Rejection

Claims 1 and 5 have been rejected under 35 USC § 103(a) as being obvious over the Joo patent in view of the Japanese publication and the Kepplinger application. See the Action at p. 3. Claims 2-4 have been rejected under 35 USC § 103(a) as being obvious over the Joo patent in view of the Japanese publication and the Kepplinger application, and further in view of the Kepplinger patent. The applicant respectfully submits that the subject matter recited in claims 1-5 (as amended herein) is not obvious over the combined disclosures of the applied prior art.

Independent claim 1 recites a method of manufacturing molten iron including supplying reducing gas through each of the successively-connected fluidized beds. The method further includes heating and partially combusting the reducing gas by injecting oxygen gas while the reducing gas is supplied to each of the fluidized beds. The method further includes directly injecting oxygen gas to

the heated reducing gas that passes through the dispersing plate to be partially combusted and further heated in the fluidized beds. Dependent claims 2-5 recite additional features of the method.

The Joo patent merely discloses a method for manufacturing molten pig iron. That method includes controlling the temperature of the reducing gas by first lowering the temperature of the reducing gas through a calcining furnace. Then, the temperature of the reducing gas is increased by supplying oxygen to and combusting the reducing gas, prior to introducing the reducing gas into the fluidized bed. The Joo patent does not disclose injecting oxygen gas directly into the fluidized bed.

The Japanese publication discloses flowing reducing gas directly from a smelting furnace to a preliminary reduction furnace. Oxygen is supplied to the fluidized bed in the preliminary reduction furnace to combust the reducing gas. The Japanese publication does not disclose successively-connected fluidized beds. The Japanese publication also does not disclose supplying oxygen to and combusting the reducing gas prior to introducing the reducing gas into the furnace. Instead, the Japanese publication discloses supplying the reducing gas directly from the smelting furnace

The cited references fail to disclose or suggest raising the temperature of the reducing gas in two stages for each fluidized bed: 1) prior to introducing the reducing gas into the fluidized bed, and 2) within the fluidized bed after the reducing gas has passed the dispersing plate. This two-stage heating of the reducing gas avoids blocking of the dispersing plate caused by overheated reducing gas. To prevent overheating of the reducing gas, the temperature of the reducing gas is raised partially by using the oxygen burner outside of the fluidized beds. Then, after the reducing gas has passed through the dispersing plate, the temperature of the reducing gas is further raised by an oxygen burner within the fluidized bed.

The Joo patent discloses that the reducing gas is already heated by the gas heaters 132 or 142 to the appropriate temperature for the fluidized bed. There is, therefore, no reason to modify the teachings of the Joo patent to increase the temperature of the reducing gas within the fluidized bed. The Japanese publication discloses that heating and combusting the reducing gas entirely within the fluidized bed solves the asserted problem of having too low of a reducing gas temperature when the reducing gas comes directly from the smelting furnace. Therefore, there is no reason to combine the teachings of the Joo patent with the Japanese publication because the material entering the fluidized bed in the Joo patent is already heated to the appropriate temperature. None of the cited references disclose or suggest heating the reducing gas prior to introducing the reducing gas into the fluidized bed, *and* within the fluidized bed and the associated advantages, such as prevention of the blocking of the dispersing plate caused by overheated reducing gas.

Accordingly, reconsideration and withdrawal of the §103(a) rejections are respectfully requested.

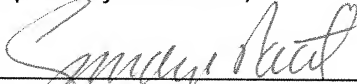
CONCLUSION

In view of the foregoing, entry of the amendments to claim 1, reconsideration and withdrawal of the rejections, and allowance of all pending claims 1-5 are respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form or procedure in an effort to advance this application to allowance, the examiner is urged to contact the undersigned attorney.

Dated: May 18, 2009

Respectfully submitted,

By 

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